PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/572,894	Examiner: Christopher S. Bobish
Applicant(s)/Appellant(s): Ian David Stones et al.	Art Unit: 3746
Title: VACUUM PUMP	Confirmation No.: 1336
Filed: March 20, 2006	Atty. Docket No.: M03B354

Commissioner for Patents
MAIL STOP **APPEAL BRIEF - PATENTS**
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Dear Sir/Madam:

Appellants submit herewith an Appeal Brief in the above-referenced matter under 37 CFR 41.37.

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I. STATEMENT OF THE REAL PARTY IN INTEREST

The real party in interest is Edwards Limited, an English company of Manor Royal Crawley, West Sussex, RH10 9LW, United Kingdom, and is the assignee of record of the subject application.

II. RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any related appeals, judicial proceedings or interferences that may be related to, directly affect, be directly affected by, or have a bearing on the Board's decision on this appeal.

III. STATUS OF CLAIMS

Claims 1, 3-29, 31-42, and 45-59 are pending in the application. Claims 2, 30, 43, and 44 are cancelled. Claims 1, 3-29, 31-42, and 45-59 stand rejected by Examiner, and are the claims on appeal.

IV. STATUS OF AMENDMENTS

No amendment has been filed subsequent to the Final Office Action dated June 10, 2010.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention described by independent claim 1 is directed to a vacuum pump *(e.g., FIG. 2, numeral 100)* comprising a molecular drag pumping mechanism *(e.g., FIG. 2, numeral 112)* and, downstream therefrom, a regenerative pumping mechanism *(e.g.,*

FIG. 2, numeral 114; page 8, lines 6-9), wherein a rotor element *(e.g., FIG. 2, numeral 116)* of the molecular drag pumping mechanism surrounds rotor elements *(e.g., FIG. 2, numeral 122)* of the regenerative pumping mechanism *(e.g., page 10, lines 25-29)*, wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism *(e.g., page 4, lines 7-15)*.

The invention described by independent claim 29 is directed to an impeller *(e.g., FIG. 3, numeral 145)* for a vacuum pump, the impeller comprising a rotor element *(e.g., FIG. 3, numeral 116)* of a molecular drag pumping mechanism *(e.g., FIG. 2, numeral 112)* and a plurality of rotor elements *(e.g., FIG. 3, numeral 122)* of a regenerative pumping mechanism *(e.g., page 10, lines 25-29)*, wherein the rotor element of the molecular drag pumping mechanism surrounds the rotor elements of the regenerative pumping mechanism *(e.g., page 10, lines 25-29)*, wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism *(e.g., page 4, lines 7-15)*.

The invention described by claim 42 is directed to a vacuum pump *(e.g., FIG. 2, numeral 100)* comprising a molecular drag pumping mechanism *(e.g., FIG. 2, numeral 112)* and a regenerative pumping mechanism *(e.g., FIG. 2, numeral 114)*, a drive shaft *(e.g., FIG. 2, numeral 104)* having located thereon a rotor element *(e.g., FIG. 2, numeral 116)* for the molecular drag pumping mechanism and rotor elements *(e.g., FIG. 2, numeral 122)* for the regenerative pumping mechanism, and a common stator *(e.g., FIG. 2, numeral 118b)* for both the regenerative pumping mechanism and at least part of the molecular drag pumping mechanism, wherein the rotor element of the molecular drag

pumping mechanism surrounds the rotor elements of the regenerative pumping mechanism *(e.g., page 10, lines 25-29)*, and wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism *(e.g., page 4, lines 7-15)*.

The invention described by independent claim 55 is directed to an impeller *(e.g., FIG. 3, numeral 145)* for a vacuum pump, the impeller having integral therewith a rotor element *(e.g., FIG. 3, numeral 107a)* of a turbomolecular pumping stage *(e.g., FIG.2, numeral 106)*, a plurality of rotor elements *(e.g., FIG. 3, numeral 122)* of a regenerative pumping mechanism *(e.g., FIG. 2, numeral 114)*, and a rotor *(e.g., FIG. 3, numeral 120)* for receiving a rotor element *(e.g., FIG. 3, numeral 116)* of a molecular drag pumping mechanism *(e.g., FIG. 2, numeral 112)* in a manner that the rotor element of the molecular drag pumping mechanism is a piece of material mounted to a separate piece of material forming the rotor element of the turbomolecular pumping stage and the rotor elements of the regenerative pumping mechanism *(e.g., page 10, line 32 – page 11, line 11)*.

The claimed inventions with reference to FIGs. 2-5 of the present application enable the high pressure chamber of a differentially pumped mass spectrometer system to be connected directly to a regenerative pumping mechanism, thereby increasing the pumping performance and consistency. *See, page 12, lines 9-15, and lines 19-26.* The benefits can be achieved without having to increase the size of the backing pump. *See, page 12, lines 15-17.*

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether Examiner errs in rejecting claims 1, 3-11, 13-17, 25, 26, 29, 31-38, 42, and 45-52 under 35 USC 103(a) as being unpatentable over EP Patent Application Publication No. 0,959,253 to Stones (hereinafter referred to as "Stones") in view of US Patent No. 5,020,969 to Mase et al. (hereinafter referred to as "Mase").

B. Whether Examiner errs in rejecting claims 18-24, 27, 28, and 39-41 under 35 USC 103(a) as being unpatentable over Stones in view of Mase and US Patent No. 5,733,104 to Conrad et al. (hereinafter referred to as "Conrad").

C. Whether Examiner errs in rejecting claims 55-59 under 35 USC 103(a) as being unpatentable over Stones.

VII. ARGUMENT

A. Examiner errs in rejecting claims 1, 3-11, 13-17, 25, 26, 29, 31-38, 42, and 45-52 under 35 USC 103(a) as being unpatentable over Stones in view of Mase.

In rejecting claim 1, Examiner acknowledges "Stones does not teach a rotor surrounding the regenerative mechanism." *See, the Final Office Action, page 5, lines 1-2.* However, Examiner provides that Mase teaches a rotor element (51A) of the molecular drag pumping mechanism (72) surrounding rotor elements (55A) of the regenerative pumping mechanism (55A, 57A). *See, the Final Office Action, page 5, lines 4-7.* Examiner asserts "it would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to locate the molecular drag pump mechanism and rotor element of Stones in the manner taught by Mase in order to further

minimize pump size." *See, the Final Office Action, page 5, lines 8-11.* Appellants respectfully disagree with the assertion.

Stones teaches away from surrounding the rotor elements of the regenerative pumping mechanism with the rotor element of the drag pumping mechanism. As shown in FIG. 3 of Stones, the rotor elements of drag pumping mechanism and the rotor elements of regenerative pumping mechanism are on opposite sides of a mounting plate, and therefore one does not surround the other. An objective of Stones is to make efficient use of space in a compound vacuum pump. *See, paragraph [0005].* In order to achieve the objective, Stones teaches a pump where "the hub diameters are kept substantially the same and the tip diameters of the rotor vanes 54 are reduced." *See, paragraph [0027].* Such stepped design enables the rotor vanes 54 at the inlet to achieve high speed, while creating space to accommodate other parts as the vanes shorten away from the inlet. *See, paragraph [0026].* If the rotor elements of the drag pumping mechanism 2 were placed on the same side as the rotor elements of the regenerative pumping mechanism 1, the space created by the shortened rotor vanes 54 would have been wasted. Such modification leads to inefficient use of space.

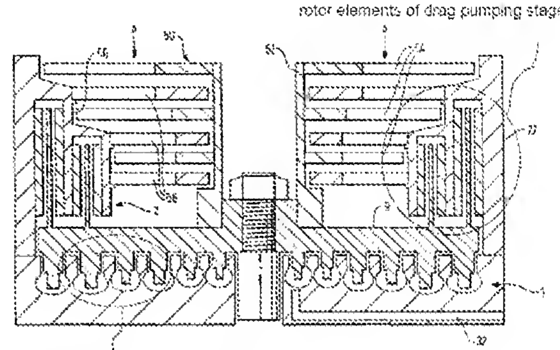


FIG. 3

Because Stones teaches away from the modification provided by Examiner, such modification is not obvious. If the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or

motivation to make the proposed modification. *In re Gordon, 733 F.2d 900 (Fed. Cir. 1984).* Since modifying Stones by surrounding the rotor elements of the regenerative pumping mechanism with the rotor elements of the drag pumping mechanism would defeat its intended purpose of space efficiency, such modification is not obvious.

In responding to Appellants' arguments above, on page 20, lines 6-15 of the Final Office Action, Examiner asserts:

> *If the Stones reference were to incorporate the regenerative and drag elements on a same side of rotor 9, the elements of the drag section would then surround and overlap the regenerative elements rather than the turbomolecular elements (as taught by Mase), the size would not be greatly [affected] in the vertical direction. In FIG. 5 of applicant's specification, the elements 116, should they be arranged as in the Stones reference, would appear on the upper side of rotor 120 and around blades 109; thus maintaining a similar size in either direction.*

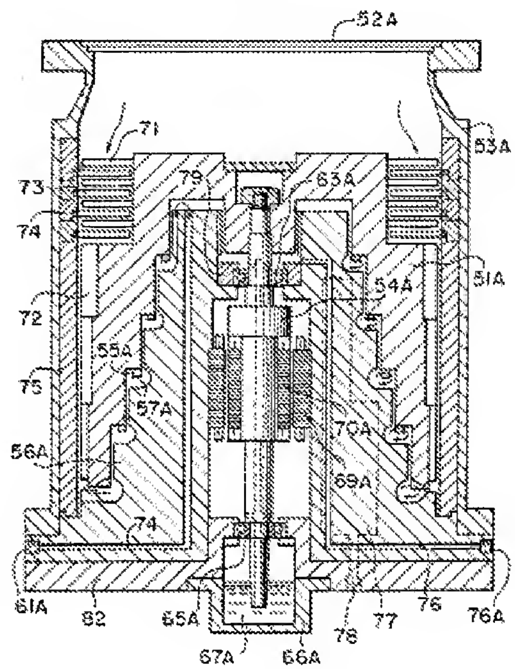
Appellants respectfully disagree with the assertion. First, the assertion ignores that Stones' rotor vanes 54 are stepped, thereby creating a space for receiving the rotors of the drag pumping mechanism 2. If the rotors of the drag pumping mechanism 2 were placed at the opposite side of the rotor vanes 54, the space would have been wasted. Moreover, even thought Examiner's proposed modification may achieve Examiner's intended purpose, it is insufficient in finding obviousness unless the modification is based on any suggestion or motivation found in Stones. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills, 916 F.2d 680 (Fed. Cir. 1990).* For the reasons discussed above, it is Appellants' contention that Examiner's proposed modification is not suggested nor motivated by Stones.

Appellants respectfully submit that Stones teaches away from surrounding the rotor elements of the regenerative pumping mechanism with the rotor elements of the

drag pumping mechanism on the same side. Thus, it is not obvious for a person skilled in the art to combine Stones and Mase as suggested by Examiner.

Standing alone, Mase fails to teach the limitation "the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism" of claim 1. As shown in FIG. 11 of Mase, impeller 51A (compared to the claimed rotor elements of the molecular drag pumping mechanism) and blades 55A (compared to the claimed rotor elements of the regenerative pumping mechanism) are made of a single, integral structure. Mase teaches integral molding as the manufacturing technique for manufacturing the impeller. *See, col. 3, lines 40-44.* It implies that the blades 55A are made as part of the impeller 51A during the molding process.

FIG. 11



It would not have been obvious for a person skilled in the art to modify Mase by separating the impeller 51A and the blades 55A into two separate pieces of structure. Mase criticizes conventional turbo vacuum pumps in which the impeller and the fixing plate are made into two separate pieces for their difficulty in maintaining process accuracy due to complex construction. *See, col. 1, lines 14-29.* It is therefore an objective of Mase to provide a turbo vacuum pump whose production and dimensional

control are facilitated so that variations in pump performance due to various factors of a production process can be minimized. *See, col. 1, lines 60-64.* Mase points out that the gas leakage between the impeller and the stator causes the pump performance to deteriorate. *See, col. 4, lines 6-11.* It suggests that the locations of the blades relative to the stator need to be properly controlled in order to avoid gas leakage and ensure the desired pump performance.

Making impeller 51A and blades 55A in a single-piece of structure by integral molding as suggested by Mase provides dimensional accuracy, simplicity of assembly, and consistency in mass production. Although, in theory, the impeller 51A and blades 55A can be made into two separate parts and then put together during assembly, it would not be practical because it would be difficult to keep dimensional accuracy for all the blades 55A mounted to various steps of the impeller 51A, complex in manufacturing and assembly, and susceptible to process variation in mass production.

As such, Appellants respectfully submit that it is improper to combine Stones and Mase as suggested by Examiner, and independent claim 1 is separately patentable over Stones or Mase under 35 USC 103(a).

Independent claims 29 and 42 include similar limitations as those of claim 1 discussed above. For the same reasons, Appellants respectfully submit that claims 29 and 42 are also patentable over Stones and Mase under 35 USC 103(a).

Accordingly, claims 3-11, 13-17, 25, 26, 31-38, and 45-52 that depend from independent claims 1, 29, or 42, and include all the limitations recited therein are also patentable over Stones and Mase under 35 USC 103(a).

B. Examiner errs in rejecting claims 18-24, 27, 28, and 39-41 under 35 USC 103(a) as being unpatentable over Stones in view of Mase and Conrad.

As discussed above, Appellant respectfully submits that independent claims 1, 29, and 42 are patentable over Stones and Mase under 35 USC 103(a). Accordingly, claims 18-24, 27, 28, and 39-41 that depend from independent claim 1, 29, or 42 and include all the limitations recited therein are also patentable over Stones, Mase and Conrad under 35 USC 103(a).

C. Examiner errs in rejecting claims 55-59 under 35 USC 103(a) as being unpatentable over Stones.

Stones does not teach the limitation "the impeller having integral therewith a rotor element of a turbomolecular pumping stage, a plurality of rotor elements of a regenerative pumping mechanism, and a rotor for receiving a rotor element of a molecular drag pumping mechanism" as independent claim 55. As illustrated in FIG. 3 of Stones, the rotor vanes 54 (compared to the claimed rotor element of a turbomolecular pumping stage) and the rotor 9 (compared to the claimed regenerative pumping mechanism) are clearly two separate pieces of structure. As such, the rotor elements of the regenerative portion of rotor 9 and the rotor vanes 54 are not an integral structure.

Appellants respectfully submit that it would not have been obvious for a person skilled in the art to modify Stones by making the cylindrical rotor body 52 and rotor 9 into an integral piece of structure. As discussed above, Stones requires the vertical portion of the rotor 9 to be placed on the same side as the rotor vanes 54 of the cylindrical

rotor body 52. If the rotor 9 and the cylindrical rotor body 52 were made by an integral structure, the manufacturing would have been extremely difficult, as it can be seen in FIG. 3 that the orientations of the rotor vanes 54 and the vertical portion of the rotor 9 would not provide easy access angles for the manufacturing machines.

As such, Appellants respectfully submit that independent claim 55 is patentable over Stones under 35 USC 103(a). Accordingly, claims 56-59 that depend from claim 55 and include all the limitations recited therein are also patentable over Stones under 35 USC 103(a).

Appellants respectfully submit that the Examiner is incorrect in rejecting claims 1, 3-29, 31-42, and 45-59 under 35 USC 103(a), and that all those claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Accordingly, Appellants respectfully request that the Examiner's rejections under 35 USC 103(a) be reversed.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. (Previously Presented) A vacuum pump comprising a molecular drag pumping mechanism and, downstream therefrom, a regenerative pumping mechanism, wherein a rotor element of the molecular drag pumping mechanism surrounds rotor elements of the regenerative pumping mechanism,

wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism.

2. (Cancelled)

3. (Previously Presented) The pump according to claim 2 wherein the cylinder forms part of a multi-stage Holweck pumping mechanism.

4. (Previously Presented) The pump according to claim 1 wherein the rotor element of the molecular drag pumping mechanism and the rotor elements of the regenerative pumping mechanism are located on a common rotor of the pump.

5. (Previously Presented) The pump according to claim 4 comprising an impeller mounted on a drive shaft of the pump, the rotor being integral with the impeller.

6. (Previously Presented) The pump according to claim 5 wherein the rotor comprises a disc substantially orthogonal to the drive shaft.

7. (Previously Presented) The pump according to claim 4 wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor.

8. (Previously Presented) The pump according to claim 7 wherein the blades are integral with the rotor.

9. (Previously Presented) The pump according to claim 7 wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor.

10. (Previously Presented) The pump according to claim 7 wherein the regenerative pumping mechanism comprises at least two series of blades positioned in concentric annular arrays on said one said of the rotor.

11. (Previously Presented) The pump according to claim 1 comprising a common stator for the regenerative pumping mechanism and at least part of the molecular drag pumping mechanism.

12. (Previously Presented) The pump according to claim 1 further comprising a Gaede pumping mechanism, the rotor element of the molecular drag pumping mechanism surrounding the rotor elements of the Gaede pumping mechanism.

13. (Previously Presented) The pump according to claim 1 comprising an additional pumping mechanism upstream from the molecular drag stage.

14. (Previously Presented) The pump according to claim 13 wherein the additional pumping mechanism comprises at least one turbomolecular pumping stage.

15. (Previously Presented) The pump according to claim 5 comprising an additional pumping mechanism upstream from the molecular drag stage, and wherein a rotor element of the additional pumping mechanism is located on the impeller.

16. (Previously Presented) The pump according to claim 15 wherein the rotor element of the additional pumping mechanism is integral with the impeller.

17. (Previously Presented) The pump according to claim 13 comprising a pump inlet located upstream from the additional pumping mechanism and an outlet located downstream from the regenerative pumping mechanism.

18. (Previously Presented) The pump according to claim 17 comprising a second pump inlet located between the additional pumping mechanism and the regenerative pumping mechanism.

19. (Previously Presented) The pump according to claim 18 wherein the second pump inlet is located between the additional pumping mechanism and the molecular drag pumping mechanism.

20. (Previously Presented) The pump according to claim 18 wherein the second pump inlet is located between at least part of the molecular drag pumping mechanism and the regenerative pumping mechanism.

21. (Previously Presented) The pump according to claim 18 wherein the second pump inlet is located such that fluid entering the pump therethrough follows a different path through the molecular drag pumping mechanism than fluid entering the pump through the first-mentioned inlet.

22. (Previously Presented) The pump according to claim 21 wherein the second pump inlet is located such that fluid entering the pump therethrough follows only part of the path through the molecular drag pumping mechanism of fluid entering the pump through the first-mentioned inlet.

23. (Previously Presented) The pump according to claim 20 comprising a third pump inlet located between the additional pumping mechanism and the molecular drag pumping mechanism.

24. (Previously Presented) The pump according to claim 13 further comprising a turbomolecular pumping mechanism upstream from the additional pumping mechanism.

25. (Previously Presented) The pump according to claim 24 comprising an additional pumping mechanism upstream from the molecular drag stage, and wherein a rotor element of the turbomolecular pumping mechanism is located on the impeller.

26. (Previously Presented) The pump according to claim 25 wherein the rotor element of the additional pumping mechanism is integral with the impeller.

27. (Previously Presented) The pump according to claim 24 comprising a pump inlet located upstream from the turbomolecular pumping mechanism.

28. (Previously Presented) The pump according to claim 1 wherein, in use, the pressure of fluid exhaust from the pump is equal to or greater than 1 mbar.

29. (Previously Presented) An impeller for a vacuum pump, the impeller comprising a rotor element of a molecular drag pumping mechanism and a plurality of rotor elements of a regenerative pumping mechanism, wherein the rotor element of the molecular drag pumping mechanism surrounds the rotor elements of the regenerative pumping mechanism,

wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism.

30. (Cancelled)

31. (Previously Presented) The impeller according to claim 30 wherein the cylinder forms part of a multi-stage Holweck pumping mechanism.

32. (Previously Presented) The impeller according to claim 29 wherein the rotor element of the molecular drag pumping mechanism and the rotor elements of the regenerative pumping mechanism are located on a common rotor of the impeller.

33. (Previously Presented) The impeller according to claim 32 wherein the rotor is integral with the impeller.

34. (Previously Presented) The impeller according to claim 33 wherein the rotor comprises a disc substantially orthogonal to the longitudinal axis of the impeller.

35. (Previously Presented) The impeller according to claim 32 wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor.

36. (Previously Presented) The impeller according to claim 35 wherein the blades are integral with the rotor.

37. (Previously Presented) The impeller according to claim 35 wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor.

38. (Previously Presented) The impeller according to claim 35 wherein the regenerative pumping mechanism comprises at least two series of blades positioned in concentric annular arrays on said one said of the rotor.

39. (Previously Presented) The impeller according to claim 37 comprising a rotor element for a turbomolecular stage.

40. (Previously Presented) The impeller according to claim 39 wherein the rotor element of the turbomolecular stage is integral with the impeller.

41. (Previously Presented) The pump comprising an impeller according to claim 27.

42. (Previously Presented) A vacuum pump comprising a molecular drag pumping mechanism and a regenerative pumping mechanism, a drive shaft having located thereon a rotor element for the molecular drag pumping mechanism and rotor elements for the

regenerative pumping mechanism, and a common stator for both the regenerative pumping mechanism and at least part of the molecular drag pumping mechanism,

wherein the rotor element of the molecular drag pumping mechanism surrounds the rotor elements of the regenerative pumping mechanism, and

wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism.

43. (Cancelled)

44. (Cancelled)

45. (Previously Presented) The pump according to claim 44 wherein the cylinder forms part of a multi-stage Holweck pumping mechanism.

46. (Previously Presented) The pump according to claim 42 wherein the rotor element of the molecular drag pumping mechanism and the rotor elements of the regenerative pumping mechanism are located on a common rotor of the pump.

47. (Previously Presented) The pump according to claim 46 comprising an impeller mounted on the drive shaft, and wherein the rotor is integral with the impeller.

48. (Previously Presented) The pump according to claim 47 wherein the rotor comprises a disc substantially orthogonal to the drive shaft.

49. (Previously Presented) The pump according to claim 46 wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor.

50. (Previously Presented) The pump according to claim 49 wherein the blades are integral with the rotor.

51. (Previously Presented) The pump according to claim 49 wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor.

52. (Previously Presented) The pump according to claim 49 wherein the regenerative pumping mechanism comprises at least two series of blades positioned in concentric annular arrays on said one said of the rotor, and the stator comprises a corresponding number of channels within which the blades can rotate.

53. (Previously Presented) The pump according to claim 42 further comprising a Gaede pumping mechanism having a plurality of rotor elements positioned in an annular array, the stator comprising a channel within which the rotor elements of the Gaede pumping mechanism can rotate.

54. (Previously Presented) The pump according to claim 53 wherein the rotor element of the molecular drag pumping mechanism surrounds the rotor elements of the Gaede pumping mechanism.

55. (Previously Presented) An impeller for a vacuum pump, the impeller having integral therewith a rotor element of a turbomolecular pumping stage, a plurality of rotor elements of a regenerative pumping mechanism, and a rotor for receiving a rotor element of a molecular drag pumping mechanism in a manner that the rotor element of the molecular drag pumping mechanism is a piece of material mounted to a separate piece of material forming the rotor element of the turbomolecular pumping stage and the rotor elements of the regenerative pumping mechanism.

56. (Previously Presented) The impeller according to claim 55 wherein the rotor comprises a disc substantially orthogonal to the longitudinal axis of the impeller.

57. (Previously Presented) The impeller according to claim 55 wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor.

58. (Previously Presented) The impeller according to claim 57 wherein the rotor elements of the regenerative pumping mechanism comprise at least two series of blades positioned in concentric annular arrays on said one said of the rotor.

59. (Previously Presented) The impeller according to claim 57 wherein the rotor is arranged to receive a rotor element of the molecular drag pumping mechanism on said one side of the rotor.

IX. EVIDENCE APPENDIX

Following references are relied upon by Examiner in rejecting the claims of the present application, and cited in this Appeal Brief. Copies of the references are separately attached to this Appeal Brief.

1. EP Patent Application Publication No. 0,959,253 to Stones is relied on by Examiner in the Final Office Action of June 10, 2010.
2. US Patent No. 5,020,969 to Mase et al. is relied on by Examiner in the Final Office Action of June 10, 2010.
3. Patent No. 5,733,104 to Conrad et al. is relied on by Examiner in the Final Office Action of June 10, 2010.

X. RELATED PROCEEDINGS APPENDIX

None